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Improving COLLEGE AND UNIVERSITY *Teaching*

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HIGHER EDUCATION

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Stanford University

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Take Home Pay

One man who presented himself for his pay envelope got quite a jolt. "I haven't anything for you this time. With the usual withholding, Federal and State tax deductions, health insurance and social security payments, you had a cash advance and you remember you missed some days. You owe the company \$14.63."

How much of this sort of frustration goes on in terms of academic coin? Do students come to the end of a course, or to the end of college, "owing the company"?

The college or university lays down a considerable sum of money per year for each student. The faculty devotes time, talent, and professional dedication to the student. The student, for tuition, books and supplies, and living expenses, spends his parents' money or his own, and devotes time, talent, and honest application to his studies.

Or does he? If the outcomes were analyzed at the close of a course, what might he find? Certainly, if there has been any inadequacy or inefficiency in the teaching or in his own studentship, his net gains will be lessened. More concretely, and nearer to himself, the thoughtful student could remember "cuts," inattention in class, neglected study, late papers or carelessly prepared reports, feeble effort. He might remember that he had been distracted by a love affair or some other emotion-absorbing situation, unfitting him for study. He might admit that he had leaned heavily on fellow students, or on the teacher. Perhaps he studied the teacher rather than the subject. These would all reduce his take home pay.

Even good students will have spots of weakness or poor achievement, but on the whole for them the ledger will be free of red and show sub-

stantial gain. They finish a course having kept the faith. They know more than they did—not merely enough to pass the final but to draw on in future. By applying themselves to the work of the course, they have developed and strengthened habits of study and thinking. They are more skilled in certain ways, according to the area of study. They have deeper and broader appreciations and interests.

Is the teacher concerned about whether his students, as they move from his course, have empty or bulging pockets? Is the college concerned when it confers degrees? University teachers have conducted studies of the outcomes of their courses which have confirmed some of their misgivings. Colleges have studied their outcomes in many ways, and have found some disturbing results. One college class twenty-five years after graduation showed that its members mainly wished "to vote the Republican ticket, keep out of the bread line, and break 100 at golf." Another group of graduates were self-centered, preoccupied with their own security and happiness, indifferent to philosophy and religion, inclined toward lethargy, and devoted to passive and noncreative leisure time activities.

Faced with evidence of faulty student achievement, what may the college, what may the individual teacher do? Shall the college pass the responsibility to the teacher since the teacher is really the only direct means of reaching the student? Shall the teacher then excuse himself on the ground that, after all, he has so many students and so little time? Shall both college and teacher pass the responsibility to the student since, in the last analysis, what the student can get from a particular course and from four years in college will be only in proportion to his own effort?

The student determines his own gains; that is a fact undeniable. But the college or university is a close partner in this business. By what it expects, demands, permits, provokes, or inflicts, it stimulates, aids, or hinders the student. When inventory is taken and credits and debits duly reckoned, should not college, teacher, and student all be in the clear? Their common concern can be stated in terms of the student and his future in which all have invested: Does the student come out with a net gain "in pocket" to justify his four years in college as an experience good in itself and a source of continuing dividends for life?

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The Heritage and Purpose of Higher Education¹

David Jacks Professor of Higher Education at Stanford University, William Harold Cowley (Ph.D., Chicago) has served on the faculty of Ohio State University, was President of Hamilton College for six years, and over a long period has given leadership and contributed through his writings to the advancement of college and university teaching. He is at work on a comprehensive study of higher education. This is his third article in this journal. A sequel to his November 1953 article "A Century of College Teaching" will appear in an early issue.

By W. H. COWLEY

On January 11, 1886 the *Pall Mall Gazette* of London published an article by Sir John Lubbock which immediately stirred up a considerable flurry in England and had prodigious reverberations in the United States: he listed what he called "the best 100 books." When John Ruskin declared the list full of "rubbish and poison," a score of well-known Englishmen joined in the controversy including the Lord Chief Justice, the poets William Morris and Charles Swinburne, the novelist Wilkie Collins, a number of leading clergymen, and Professors James Bryce and Max Müller of Oxford.

A dozen years later an American publishing house decided that something could be done commercially with the idea of best books and published in 60 volumes *The World's Great Classics*. It got Timothy Dwight, the just-retiring President of Yale, to head the editorial committee. Then a decade later appeared the *Harvard Classics* edited by President Emeritus Charles W. Eliot of Harvard. Both enterprises made a great deal of money for their promoters and editors. Almost 300,000 sets of the *Harvard Classics*, for example, were sold during the 17 years between their appearance and Mr. Eliot's death.

Professor John Erskine of Columbia brought the idea of great books into the academic world in 1919, and from there it spread to the University of Chicago and to St. John's College, Annapolis. Not proving to be the curricular panacea that Mr. Hutchins thought it, the idea has now returned, by means of the Great Books Founda-

tion, to its original habitat, namely, adult education: Lubbock had made his list for an adult education group in London.

Probably some here today belong to reading circles of the Great Books Foundation and thereby extend and deepen their awareness of the heritage of which we are all both debtors and trustees. Perhaps others have not joined such circles, however, for the reason that Darwin gave to Lubbock when he asked him what he considered to be the world's greatest books. Darwin replied that because every subject is the center of the universe and leads into every other, one should read widely and deeply in the subject in which he is most interested.

Since my undergraduate days I have been interested in the problems of colleges and universities, and so I have been trying to read the great writings—books, addresses, articles, documents—concerned with higher education. They range from Isocrates' address "Against the Sophists" with which he inaugurated his famous school in Athens several years before Plato founded the Academy, to such current books as *General Education in a Free Society* written by a committee of Harvard professors in 1947. Herbert Spencer observed that education is "the subject which involves all other subjects," and I have found that reading the great writings of education leads into most other great writings.

The Program Committee has asked me to speak about the heritage of higher education because presumably it thinks heritage important. I hope it has not misinterpreted the interests of the Association. When I began teaching at Stanford a decade ago, I opened my introductory course with a 15-item identification test, each item being the name of an individual who has potentially influenced the present practices of American colleges and universities. I have long since abandoned the test, however, because it got me off to a bad start. I discovered that my students—all of them enough interested in higher education to elect the course—had little knowledge of higher educational history, and moreover, considerable antagonism toward learning any. I found that I had to woo them more patiently. In any case, here are the names on that ill-fated identification test: James Burrill Angell, F. A. P. Barnard, Timothy Dwight the Elder, Charles W. Eliot,

¹ An address before the Western College Association, Los Angeles, California, March 25, 1955.

Daniel Coit Gilman, William Rainey Harper, Mark Hopkins, James McCosh, Eliphalet Nott, Noah Porter, Henry Philip Tappan, George Ticknor, Jonathan Baldwin Turner, Francis Wayland, Andrew Dickson White. Most students did not recognize more than two or three of these names, and at the end of the test the class always bombarded me with such angry questions as "Who cares?" and "So what?" I responded by quoting Walter Lippmann's eloquent plea for a better understanding of our national heritage. He wrote it during the second world war when he and others despaired of our future because our ignorance of history led to serious mistakes in foreign policy. It reads:

When shall we recognize the truth of our situation? Only when we see ourselves and the events of our day as one act in a drama which began long before we were born and will not be played out until long after we are dead. We shall never manage the present, or make any sense of it, unless we have explained our past well enough to imagine our future.

I am not, may I observe, an historian and am not, despite rumors I keep hearing, engaged in writing a history of higher education. I am concerned with problems of the here and now and use history as one of the dozen or so tools that the systematic student of social institutions needs. Long ago I learned that coping adequately with the present requires an understanding of the historic continuum. This I visualize as a graph whereon the present constitutes but a fleeting point in time emerging from the long and direction-pointing past into the ever-arriving future. All previous history has made its markings on the graph, and we add ours to the continuum that the past forces upon us and from which we can deviate only when we have enough power to counteract its inertia. To determine what markings we are able to make requires, first, that we understand the directions and momentum of the graph we inherit and, second, that we assess the forces at our disposal to swerve it.

► Let me illustrate the significance of the historical continuum by turning to the second topic assigned me by the Program Committee, namely, the purposes of higher education. First, however, the terms *higher education* and *purpose* need defining as I shall be employing them. Higher education, may I point out, is an abstraction. In using it people mean a half dozen different things, but in this paper I shall chiefly mean the institutions—colleges and universities—per-

forming the educational function above the level of secondary schools. Note well the word *function* in the last sentence because, although related, a function and a purpose differ. To illustrate: walking is a function of normal human beings; but unless one walks just for the exercise, or in a parade, walking is not a purpose. Rather one's purpose is to arrive at some desired destination.

Colleges and universities perform a dozen or so functions for society including educating students, investigating the nature of the world and of man, conserving the heritage of the race in libraries and museums, screening out those unfit for the more difficult occupations, criticizing society and its practices, acclaiming worthy individuals by means of honorary degrees, providing havens for creative individuals. Behind each of these functions is a purpose or a complex of purposes. Many professors love to teach, but their essential purpose in teaching is not just to perform the teaching function but, rather, to communicate facts, concepts, and enthusiasms about some particular subject. Similarly, many professors engage in research, but they conduct their investigations not just to be doing research but because they seek answers to problems which they consider important or, perhaps, to win raises in rank or salary.

So much for the distinction between functions and purposes. The history of the evolving functions of colleges and universities abounds with drama, but perforce I concentrate upon the history of the purposes behind just one of these functions, namely, the educational function. One further clarification of terms, however, must be made, to wit, the identification of three stages in what might be called the purposive-act circuit: first, the *subjective* intention to do something, second, the *projective* actions resulting from the subjective intention, and third, the *objective* toward which one acts.

In healthy functioning these three stages in the purposive-act circuit intermesh in completed acts. Most individual and social institutions, however, have a number of subjective purposes which never get into the third or objective stage and which in the second or projective stage go no further than talk or writing. John Dewey branded these sentimental purposes and their owners sentimentalists, and William James illustrated them with the story of the Russian woman who talked much about the need of improving the condition of the working classes but who let the driver of

her droshky freeze waiting for her while she attended the opera.

The literature of higher education slops over with effusions about sentimental purposes. Consider, for example, the constantly repeated statement that the purpose of a college education is to teach students to think. Everybody applauds such declarations, but it is one of those exuberant clichés designating a subjective purpose so vaguely defined that it leads to inadequate projective action and hence to shabby objective results.

This short-circuiting was not always so as a study of the historic continuum makes clear, but instead of tracing the history of the purpose of teaching students to think, let me review another on which I have done more work: the purpose of promoting "the liberal arts." The statement that colleges exist to teach the liberal arts, I shall try to show, is vagueness incarnate and therefore inevitably produces faltering projective purposes, jumbled and insufficient objective purposes and, further, frustrating confusion.

► The term "the liberal arts," of course, goes back to the Romans and has antecedents in Plato and Aristotle. Beginning with Cappella in the fifth century they got limited to the famous Seven, a number which, incidentally, neither the Greeks nor the Romans ever associated with them. The much vaunted Seven Liberal Arts constituted the curriculum of the medieval schools; but they were such poverty-stricken studies that the medieval university could not develop until they had been superseded by the Three Philosophies of Aristotle, an event taking place toward the end of the 13th century. Neither the Seven Liberal Arts nor the Three Philosophies of Aristotle, however, included the classical languages which came into higher educational curriculums during the Renaissance. Nor did they include experimental natural science or fact-anchored social science which did not gain admission to curriculums until less than a century ago.

Meanwhile the meaning of the term the liberal arts expanded from the widely advertised seven and not only included the classical languages but, indeed, came to be synonymous with them. Otherwise expressed, during the 19th century the liberal arts meant what also went by the name of classical education. What are the liberal arts today? I would readily accept a wager that if everyone in this audience were to write out his definition of them we would find very little

agreement. The nearest we would come to a generally accepted definition would probably be this: the liberal arts are the subjects taught in so-called liberal arts colleges. This latter appellation, by the way, is only about 65 years old and is not so widely employed as some seem to believe.

Assuming that the liberal arts are the subjects taught in liberal arts colleges, are chemistry and physics, economics and psychology, dramatics and physical education liberal arts? The doughty supporters of the classics of earlier times would have scorned the suggestion. This would not, of course, be of any consequence if we today could agree on what we mean by the term; but we do not and probably can not. It served nobly for many centuries, but long ago it died of the infirmities of age and cries out to be buried. Its continued use not only betrays sentimental purposes but also contributes conspicuously to the snarled and baffled state of higher education.

► It seems to me that the term liberal education needs the same kindness and is, as I shall in due course show, giving way to two other terms. It first appeared in the English language in Shakespeare's time although Shakespeare himself never employed it. Nor did his scholarly contemporaries who produced the King James version of the Bible. Only an occasional writer penned it during the next 250 years. Thus neither Mark Hopkins in his inaugural address at Williams in 1836 nor Josiah Quincy in his two-volume history of Harvard published in 1840 found any need of using the term liberal education.

Although the two writers of the extraordinarily influential Yale Report of 1828 brandished the phrase to belabor educational tendencies that they feared and hated, it did not achieve wide popularity until after the printing in this country of John Henry Newman's 1852 Dublin lectures entitled *The Idea of a University Defined and Illustrated*. Beginning about then it took hold, but a number of key educators avoided it sedulously. Thus in his celebrated inaugural address as President of Harvard in 1869 Charles W. Eliot made not a single reference to liberal education because, as he had earlier made clear, it meant to him what he considered to be the two greatest enemies of educational progress: first, classical education whose monopoly he sought to break and, second, the education of the gentleman, which he castigated as "beneath contempt" in democratic America.



Down to the mid-nineteenth century the liberal arts and liberal education meant the education, especially in the classical languages, of the men of leisure and economic self-sufficiency known as gentlemen. The Industrial Revolution and the Jacksonians, however, so effectively banished the gentleman from American life that Professor Charles Eliot Norton could observe to one of his Harvard classes about 1890 that "None of you, probably, has ever seen a gentleman." Today the concept of the gentleman has been even further limited to the courtesies of legislative bodies, to saluting audiences at the beginning of speeches, and in high-priced hotels to labelling half of some rather essential white-tiled rooms.

Undoubtedly most of us would welcome more emphasis upon the gracious manners of the gentleman of blood, wealth, and leisure; but I know of no one who today believes that the prime purpose of higher education is to produce gentlemen. Nor are many still about who believe that the classical languages should again be the core of college and university curriculums. Those who do are unreconstructable sentimentalists in the Deweyan sense: they cannot convert their deeply cherished subjective purposes into either projective or objective purposes because the rest of us stand in their way.

► Some educators have tried and are still trying to rescue the term liberal education from its long aristocratic associations by defining it as liberating education. Such an effort in sports would call forth the exclamation "Nice try!" because it does not quite come off. Clearly all education is liberating as witness the student, for example, who completes a course in automotive mechanics. In learning the principles of gasoline engines and the methods of keeping them in good repair, he is liberated from ignorance about such matters and is equipped to apply his knowledge for the benefit of his customers.

Those who define liberal education as liberating education mean, of course, spiritual and high-level intellectual liberation which, they aver, can be achieved only through the subjects that have lately come to be called the humanities. Hence they are dropping the term liberal education and substituting "humanistic education" and its correlates. When half a dozen years ago, for example, Stanford reconstructed its undergraduate work and, for the first time, organized what would have been called a college of arts and sciences or a college of letters and sciences, it named the

unit the College of Humanities and Science.

This is another nice try, but the name "the humanities" has encountered difficulties not only because of its invidious implication that the sciences and social sciences are unhumanities if not inhumanities but also because some quite important people object to it. For example, some years ago Ralph Barton Perry, eminent Harvard philosopher, wrote:

There has lately developed a practice of grouping departments under "divisions," a popular classification being: physical science, biological science, social science—and "the humanities." Now this is a most extraordinary arrangement. In an institution which professes to exist for the purpose of inculcating it, liberal culture is only one quarter of the whole; and a nondescript quarter, occupying the place of a sort of rearguard appointed to pick up the stragglers and misfits which find no place higher up in the procession.

In the same vein John Erskine has written that "I have no use for a definition of the humanities which excludes the sciences. Louis Pasteur is for me one of the greatest of humanists." In turn, Professor Gilbert Chinard of Princeton has declared that "humanism is not a subject which can be taught, but a state of mind and a discipline which permeates all human activities."

► The effort to substitute the phrase the humanities for the older term liberal education began only about 30 years ago but has been in competition with the much older locution "general education." I say "much older" because until this present century the humanities meant the Graeco-Roman classics and only the Graeco-Roman classics. The term general education, however, goes back in the form of "general studies" to Milton's *Tractate on Education* written in 1644 and had wide usage in its present form during the middle of the 19th century. In his inaugural address Mark Hopkins discussed not liberal education but general education, and so 33 years later did Charles W. Eliot in his inaugural. Because of the new lease on life that Newman and his fellow-thinking contemporaries gave to "liberal education," "general education" went into eclipse and had little vogue until about 40 years ago. Then the group known as functional educators reintroduced it to designate their "student-needs curriculum."

Despite the lowly status in the academic world of the functional educators, the term general education has again achieved wide currency in part because the committee of Harvard pro-

fessors which produced *General Education in a Free Society* chose it a decade ago in preference to the term liberal education. One of the serious limitations of the term general education, however, is that it has a number of contradictory meanings including these four:

- 1 The functional curriculum emphasizing student needs.
- 2 The courses in the typical college which are primarily preparatory for advanced courses or which are admittedly preprofessional.
- 3 The unitary general education courses taught at Harvard and a number of other institutions which have appeared to counteract the powerful trend toward making all courses either preparatory or definitely specialized.
- 4 The integrated general education programs at Columbia, Chicago, and a few other colleges and universities.

Some of the proponents of the humanities limit the meaning of general education to the functional curriculum which they abhor, but others consider the humanities to be a division of general education. In any event, whenever I read the words general education or hear anyone use them, I must determine which meaning is intended. This does not make for easy communication and, further, the term has another potent count against it: it does not in itself suggest the breadth and depth of understanding and commitment that our best colleges seek to give their students before they begin their specialized career education.

The history of the phrase makes it clear that it means the education of the generality of people in the generality or commonality of knowledge, skills, and attitudes; but good higher education seeks to give students not only commonality but also breadth and depth beyond that possessed by the generality of people. Indeed, this has been one of the two essential purposes of higher education since it began in the western world four centuries before Christ, the other being specialized preparation for careers.

As far as I can discover, no one has thought up a generally acceptable name for the purpose of educating students for breadth of commonality, and so I have been calling it education for advanced commonality. By commonality I mean the nonspecialized knowledge, skills, and attitudes needed by everyone; and the adjective advanced means broad, wide, and—for skills and attitudes—also deep. I do not believe that this cumbersome

name will be popular, and so I am hopefully waiting for a better one to emerge. I have found none in exploring the historic continuum.

It may seem that I put undue stress on names, and beyond doubt some of you are thinking of Shakespeare's lines

What's in a name? That which we call a rose

By any other name would smell as sweet . . .

Shakespeare, however, did not really believe that as witness his many other passages about names and naming. Literature teems with discussions of naming, and from the large number that I have been collecting I quote two which seem to me to be especially pregnant with wisdom. The first comes from one of the poems of James Russell Lowell and reads:

Let us speak plain: there is more force in names
Than most men dream of; and a lie may keep
Its throne a whole age longer if it skulk
Behind the shield of some fair-seeming name.

Samuel Butler wrote the other. "*The Ancient Mariner*," he observed, "would not have taken so well if it had been called '*The Old Sailor*.'"

Names attract or repel, and fortunate is the enterprise whose name unites its friends. Unhappily, many of the names we use in education sunder people into warring factions. Somehow we need to end the resulting battles and bitterness.

My proposed "advanced commonality" probably is not the name that will unify the several groups concerned with the nonvocational purposes of colleges and universities; but if we can agree about the urgent need of finding a good name, perhaps the right one will one day appear.

Meanwhile may I suggest that a most essential element of commonality is common courtesy of which we need more in educational discussions, that the adherents of the term liberal education recall that one of the ancient and continuing meanings of liberal is generous, and that the proponents of the humanities meditate more frequently upon the humilities.

People sometimes refer to higher education as the higher learning, but colleges and universities are much more than knowledge factories; they are testaments to man's perennial struggle to make a better world for himself, his children, and his children's children. This, indeed, is their sovereign purpose. They are great fortifications against ignorance and irrationality; but they are more than places of the higher learning—they are centers and symbols of man's higher yearning.

Stimulating an Appetite for Knowledge and the Projection of It

Sister Mary Domitilla Arnoldy, C.S.J., took courses in teaching preparation at Kansas State Teachers College, Hays, and at Creighton University, Omaha. With her B.S. degree from Kansas State College and her M.S. from Notre Dame University, she also has done graduate study at Notre Dame and the University of Missouri. She attended the North Central Workshop at the University of Chicago during the summers of 1953 and 1954. She is instructor in biological science at Marymount College, Kansas.

By **SISTER MARY DOMITILLA ARNOLDY**

If American education is to maintain a unifying purpose and intelligent outcomes, it needs to develop an imaginative, critical, informed citizenry. The method of obtaining such citizens has shifted somewhat within the past half century, from the aristocratic intent to the service of democracy. Yet the knowledge gleaned from the past enriches the meaning of the present and so it gives to society the reassurance and confidence that comes from a sense of continuity. Belief in the dignity and mutual obligation of man provides the common ground for the true concept of education. The aim of all education is not only what a free man should know but also what he should do. One must be able to revise his store of knowledge, be able to change it in the light of new discoveries and situations—hence the well integrated person is more and more concerned with values as well as knowledge, with motives as well as facts, with social purposes as well as individual interests.

We in American higher education are concerned with the preparation of youth for effective and successful living in the social, political, and economic environment in which they find themselves. It is our concern to direct all efforts toward individuals, to find out what they possess, and develop this to its maximum. Education must be student centered. The sooner the student becomes aware of the fact that all the knowledge he ever gets is that which effects a voluntary change in himself, the better fitted will he be to acquire more, for it is only that knowledge that

becomes workable for him that he will project into the daily affairs of his life.

Effective learning must, therefore, be self-education, self-propelled intellectual activity, self-direction, and self-mastery. People do not learn through passive absorptions but by active learning experiences and intellectual development through meaningful opportunities in daily encounters.

A student must be made aware of his part in this educational endeavor, hence it rests with the instructor to conduct the student into pathways that challenge his inner self, that arouse his curiosity and whet his appetite to satisfy his desire for the knowledge that will effect a change in him for a better, more effective, and more meaningful life. The responsibility for awakening in each student this dynamo of inner resourcefulness and creativity that is perhaps latent, perhaps weakly active, requires intellectual sympathy on the part of the instructor. The intuition that is only slightly heeded may arouse the interest in the student. No tricks and no techniques can do the work, but personal attention and an understanding of that inner blossoming of the God-given rational nature found in each individual will set the stage for the development of self in producing that free good man we so ardently desire. He must be trained to help himself.

A mind that is integrated, enamored with truth, logical in thought, and balanced in judgment is an intellect that has attained the perfection which God and nature intended it to have and is indispensable for clear, critical thinking in the solution of the world's social, political, and personal problems. The task of education is to teach students how to employ their intellectual powers correctly and efficiently. On the other hand, the student must realize his part in this team work operation.

A lack of seriousness in the college student today is possibly due to the absence of a realization of his own importance in this drama of education. He is the star—teachers, books, equipment, and all else are the props, scenery, and cast. The inner force in him is his will power that must be the propeller to set the machinery into action.

No one can project that which he does not possess, and when he has a chance to use the store of knowledge and skills that he has acquired, he must realize its valuable application before the projection is made, otherwise the missile will go astray, but if it accomplishes its mission something will return in a sort of boomerang fashion to stimulate him to better and greater attempts in the future.

A student must break down all knowledge that comes to him to suit the level of his mind, effect a change in attitude toward it, properly evaluate it, and make it meaningful to him. Unless the student focusses his mind on the subordination of the pursuit of pleasure, he will neglect the graver responsibilities toward higher principles, thereby losing the true meaning of the incidences in life which must be carried over into all worthwhile activities. The Rt. Rev. Joseph E. Schieder, National Youth Director, says, "Responsibilities are the most educative burdens that come to

youth." Therefore, the self-education is a responsibility that makes the youth grow into powerful manhood, becoming an asset to his community and country. With a broad mind capable of long range planning, he will meet the many problems manfully with unselfish constructive solutions.

Education or the training of such a mind is a life-time process that involves the faculty in a college and the learning experiences and environmental influences of the student. Instructors and environment each play an important role, but the realization of how to project the accumulated facts and skills lies entirely with the learner. Awareness during the learning process, the practical applications, and the necessary adaptations needed in each situation will probably stimulate the desire of the student to project the best in him so as to become the desired citizen an American education aims to produce.

Varying Emphasis in Teaching

"Different aspects of learning receive varying emphasis by different teachers, too. To some members of the faculty learning means especially a refinement of techniques of criticism, the achievement of form, or of discriminating logic. To others the emphasis is upon heightened sensitization to qualities of experience, freedom from bias, broader orientation, while still others emphasize the release of powers of expression, of creativity. Some concentrate upon stocking the mind with information, or upon acquisition of skills in language, crafts, dialectic; and others focus upon 'insight,' 'perspective,' 'understanding.'"—Lois Barclay Murphy and Henry Ladd, *Emotional Factors in Learning*. New York: Columbia University Press. 1944. Page 71.



Counselor Librarians Stimulate Reading and Learning

In the February 1955 issue, Perry D. Morrison cited the library of the Chicago Undergraduate Division of the University of Illinois as an extreme service where librarians "seek status as educators by posing as personnel workers" at an opposite pole to libraries which are essentially "warehouses" of book collections. The librarian of the Chicago Undergraduate Division, however, does not regard his library as extreme. Counselor librarians, he believes, help to make "the moment of contact between a book and a reader" more educationally significant.

By DAVID K. MAXFIELD

In 1952, a well known library author stated that the college librarian can "also be a valued member of the guidance and counseling staff" of the institution to which it belongs. This authority, however, did not go on to outline any specific arrangements whereby a college library could participate effectively in a fully developed counseling and advisement program.¹ In the Department of Library Instruction and Advisement, set up in 1951 in the library of the Chicago Undergraduate Division of the University of Illinois, qualified librarians counsel students in situations connected with library reading and reference work.

Counseling is a process, usually involving personal interviews, concerned primarily with attitudes—attitudes which motivate thinking and learning and make them possible. Successful counseling leads to changes within the counselee that enable him to be more self-responsible, to make *for himself* wise decisions regarding his own life, and to extricate *himself* from any immediate difficulties. Counseling is not mere advice-giving, guidance, or imparting of information, although the effective development of all these elements is often essential to its success. At its best, it is apt to be a collaborative activity, since the counselor attempts to place much more personal responsibility for the making of decisions upon the counselee than a teacher or adviser is likely to do. The development of effective counselor librarians was no easy process.

Four factors led to the organization of this department: (1) general education objectives including helping students to learn to think and stimulating their intellectual curiosity; (2) giving

of instruction to students in the use of the library; (3) the recognized limitations of the reference approach; and (4) the "student personnel point of view." The objectives in general education called for emphasis on the personal development of each student as a citizen and as a person and required a "student-centered" type of library service. Conventional reference work probably does not always place quite as much emphasis upon the library patron as an *individual person* as it does upon library materials and bibliographic techniques. College librarians perhaps should give more careful attention to the individual needs of their undergraduate patrons. It was believed that suitable collaboration with the Student Counseling Bureau might open up new dimensions for library service.

Setting up the new department involved a special recruitment program. Five seasoned librarians were chosen who considered librarianship to be a positive educational force and who were believed to have enthusiastic interest in young people, deep knowledge of books and other library materials, important reference and library instruction experience, specific qualifications for classroom teaching and leadership of group discussion, and mature and outgoing personalities. A clerk-typist and several part-time student assistants were provided. The five professional staff members have academic titles of Instructor or Assistant Professor of Library Science as well as the title of Counselor Librarian. Through in-service training conducted by graduate psychologists from the Student Counseling Bureau, they qualified as part-time counselors by the end of their first year, although their training still continues.

The department's work includes instruction of students in the use of the library, perhaps the major function for at least several months of the year, operation of the Advisory Information Desk, and liaison activities. The Advisory Information Desk activities include reference work which in one year involved some 4,989 "search" and "information" reference questions. Thanks to the in-service training, greater interviewing finesse is possible. The amounts of time spent with each student are, on the average, larger than in the past. Students are helped to think through their reference problems and formulate

their questions more suitably before going off on long, involved searches. Reference work and other conventional library services have been in no respect curtailed. By making reference service, readers' advisory assistance, and library instruction a part of the broader areas of general education, applied psychology, student personnel work, and reading and study skills, the significance of the usual library services probably has been enhanced.

Counselor librarians function in the library. They are concerned with "counseling" or "guidance" as it may be used to make "the moment of contact between a book and a reader" more educationally significant. Counselor librarians do not become professional psychologists or acquire clinical training.

Some of the contributions of the Department of Library Instruction and Advisement are diffi-

cult to measure. Certain trends, however, seem to be apparent in the response of the student body. Circulation of books of all kinds has increased far out of proportion to the acquisition rate, and even increased in certain recent years when enrollment was dropping. Rising use of the library materials in the reading rooms has necessitated employment of more shelving assistants. The number of "elementary" reference questions has gone down in the past four years. The total number of reference questions, however, has increased markedly. In increasing degree, students with library self-confidence and ability to "think bibliographically" seem to be exhausting routine sources on their own before seeking help.²

¹ Johnson, B. L., *General Education in Action*. Washington, D.C.: American Council on Education, 1932, Chapter XV.

² Fuller treatment of Counselor Librarianship is given in *Occasional Paper, No. 38* (March 1954) of the University of Illinois Library School, Urbana, Illinois, obtainable on request. See also "Counselor Librarianship at U. I. C.", *College and Research Libraries*, April 1954, Vol. XV, pp. 161-167.

Breath of Life

"I believe men and women would be spurred to far higher development if they were convinced that it is not some special genius conferred upon the few, but the wise use of the gifts common to all, that makes life rich and valuable. . . . This has been the secret of the success of nearly all the great leaders of men; they knew how to call up the latent energy of their followers, to put into them a purpose and a determination that made them giants. The moral of this for the University is plain. It may, it can, it should, give to the youth of the state this awakening impulse, breathe into them this breath of life, rouse them not to mere physical courage but to the courage of high conviction, give to them aims, ambitions, purposes, which shall transform, transfigure their whole lives."—Professor Maria Sanford of the University of Minnesota. Quoted in: Helen Whitney, Maria Sanford. Minneapolis: University of Minnesota Press, 1922. Pages 209-210.

Absolute Standards of Achievement Using Objective Type Examinations

Where should the dividing line between passing and not passing be set? The Assistant Director of Research at Western Washington College proposes something better than the traditional seventy per cent point and probably better than standards often currently used.

By WILLIAM C. BUDD

Much has been written concerning educational standards within the past few years and doubtless this subject will continue to be a topic of heated discussion. The ramifications of the topic are many and varied and would provide suitable material for one or more volumes. The purpose of this article is not to enter into the polemic surrounding the nature of standards but rather to popularize a new approach to one aspect of the problem.

Those individuals who appear most concerned about the nature of educational standards have sometimes selected as a target for special attention the increasingly widespread use of objective examinations. Such examinations are resented upon a number of bases. It is claimed that they promote the wrong type of learning by allowing students to recognize the correct answers instead of forcing them to recall the answers. It is also claimed that at least a portion of the modern student's seeming inability to write a coherent phrase is due to the overemphasis upon this type of examination. Probably the most damning criticism leveled at the objective examination is that achievement measured by it can have only a relative meaning. Every college student is aware of the implications of the expression "grading on the curve." This is not to say that relative grading practices are any more a function of objective examinations than of essay examinations. Grading practices are essentially independent of the type of examination employed.

In recent years, however, at least a few college instructors have been using a system which, if it were more generally practiced, might tend to mitigate the force of such criticisms. This system is particularly appropriate to the multiple-choice type of item which is undoubtedly the most useful of the objective item forms. It can be

applied, with some reservations, to the matching type of item form. Its application to the true-false type of item is, however, doubtful at best.

Using as an example an examination composed entirely of multiple choice type items, the system operates as follows. Each response of each item is carefully scrutinized. For each item the instructor selects those responses which are so obviously incorrect that only a failing student would select them as the correct answer. Such responses are designated as F or failing responses. A given item may have one or more such responses or it may not have any. Then a weight is assigned to this item equal to the reciprocal of the number of remaining or non-F choices in the item. The assigned weights for all of the items in the test are then summed to provide a minimum passing score for the examination.

The logic behind the system is based upon simple probability theory. It is assumed that the barely passing student is the one who has enough knowledge that he can reject only the most illogical of the possible answers. He must then choose at random among the remaining responses. If, for example, he can eliminate one response of a five response multiple-choice item, he then has one chance in four of obtaining the correct answer by guessing. The sum of his chances on all the items of the test provides a defensible standard which he must meet in order to pass the examination. The system can also be extended to identify the C, B, and A students through a similar process although it becomes more difficult to apply at these levels.

Like other techniques, proficiency requires practice and some insight into the probable thought processes of students. Nedelsky¹ has recently reported the results of a large scale study at the University of Chicago using this technique. The method used by Nedelsky is more refined and uses more statistical applications than the average college instructor is willing to perform. The technique in its simplest form as described in this article, however, is well within the mathematics of anyone who can add fractions.

This technique differs in its basic logic from

¹Leo Nedelsky, "Absolute Grading Standards for Objective Tests," *Educational and Psychological Measurement*, 14:1-19, 1954.

General Education Science Programs

The chairman of the Division of Natural Science at Chico State College, California, shares with us some fruits of a sabbatical year devoted to first-hand study of science programs for general education. The author has degrees from three universities: B.A., Oregon; M.A., Columbia; Ph.D., Stanford. She points out that studentship and faculty vision are vital to the success of any program.

By VESTA HOLT

The organization of a science program which fulfills the objectives of general education poses problems which are unique to science. In addition to the basic requirements of general education, science itself has principles which no scientist will ignore. He will demand of any science course an emphasis on truth, accuracy in observation and report, and a tentative acceptance of conclusions—in other words, a scientific attitude in all phases of the program.

The many different types of general education science courses are the result, not of differences in point of view but of the sheer size of the problem. The author recently visited science classes in the general education programs of a number of col-

Absolute Standards—concluded

the old concept of 70 per cent passing which was for so many years identified with the enforcement of educational standards. That system was based upon an arbitrary cutting point made without specific reference to the content of the items in the examination. The system here suggested, although still based upon subjectively chosen items, establishes a cutting point with reference to logically derived standards of achievement. Where several instructors teaching the same course participate in the process, judgments can be pooled and standards even more defensible established.

It is an inescapable fact that judgment with respect to the attainment or lack of attainment of educational objectives will always be a subjective process. Standards relating to such attainment are also subjectively selected whether they are absolute standards or relative standards. For those persons who feel that only absolute standards are defensible, the technique described in this article should prove of some value.

leges and universities in the eastern part of the United States. The ideas expressed in this article are the result of observations made, primarily during this study. The colleges were chosen, first, because they had notable general education programs and, second, because they represented different types of colleges in regard to size, character of student body, and source of financial support. Certain problems which are minor in a small college with a selected student body become greatly magnified in the heterogeneity of several thousand students in a course at one time.

OBJECTIVES

The agreement of the different colleges on the objectives of science in general education is notable. These objectives include two overlapping categories, personal and social. A mature, well-rounded individual is, thereby, a more effective member of society. The objectives may be listed as follows:

- 1 An understanding of the nature of one's self, physically and mentally, as a basis for developing a desirable maturity and a preparation for effective living.
- 2 The development of clear thinking, scientific attitudes, spirit of inquiry, and experience in the use and application of scientific methods to the problems of modern life.
- 3 A conception of the implications of scientific discovery to the individual and society and an understanding of natural principles which underlie many of our social, economic, and international problems.
- 4 An appreciation of the place of scientific knowledge in our modern culture. Some colleges have local objectives in addition to the above list which are related to the particular functions of the college.

ADMINISTRATION

The administration of the general education program varies widely in the different colleges. In some larger colleges a separate college is maintained—as the University College at the University of Florida; the College of General Education at Boston University, and the Basic College at Michigan State. Such a college has its own dean, faculty budget and perhaps buildings, and is quite independent of the rest of the University. The

staff is chosen on a basis of its preparation or interest in general education work, an attempt is made to arrange the loads of the science instructors so that they have time for research and they are urged to do scientific research so as (1) to be better teachers, and (2) to maintain prestige among scientists. The dean is assisted by a committee each member of which is usually chairman of his particular area and in turn is assisted by sub-committees which formulate objectives, develop the program, plan its execution, and write syllabi, subject to the approval of the dean and his advisory committee.

In most colleges under 5,000 enrollment, general education is in the college of liberal arts and the liberal arts faculty participate in teaching the general education courses. The bases for this arrangement are: (1) that all college teaching profits by an infusion of the general education philosophy, (2) that general education courses should have the best trained men in science, and (3) that, thereby, one is not likely to criticize destructively a program of which he is a part, nor consider that general education instructors are a step lower on the academic ladder. The program is directed by a general education committee composed of representatives of the participating areas. These representatives may be instructors in the program or heads of the departments represented. The chairman may be the dean of liberal arts or he may be chairman of "General Studies," "Interdepartmental Courses," "Integrated Studies," "Core Curriculum," "Nuclear Curriculum" or whatever the general education program is called, and responsible to the dean of liberal arts. This organization is less centralized, with more autonomy in each area, hence more variation in patterns and less integration between areas than in the separate colleges.

There are advantages and disadvantages to both procedures. The separate organization makes for greater efficiency and understanding on the part of those teaching the course. But it also leads to a fear on the part of the academic staff that the course will degenerate into pseudo-science. In the second pattern, excellent work is being done where the staff really understands and approves the objectives of the course. Often, however, it demands teaching in areas outside the specific field of the instructor, and time and inclination may interfere with his interest, enthusiasm, and effectiveness as a teacher. Any teacher with too many pressing demands in different directions is

apt to fulfill some of them poorly or become thoroughly frustrated in an attempt to spread himself so thin.

As a rule, the general education courses are taken in the freshman and sophomore years, but in colleges where the student has a choice of general education courses, such as at Harvard, University of West Virginia, and Smith, upper division courses also are available.

ORGANIZATION OF COURSES

In all cases, those in charge of the science courses are free to work out their own program within the given framework. Hence, the character of the program depends upon the philosophy of those who plan it. The degree of cooperation of members of the science faculty is also a factor affecting the character of the general education course. For example, in one college the botany department refused to participate; hence the biological science course was largely zoological in subject matter. In another, chemistry refused to participate in a physical science course. The members of any department refusing to cooperate are usually highly incensed if an instructor not well trained in that field dares to include any of its material in his course.

In most colleges separate courses with similar objectives are given in the physical and biological sciences. The vast amount of knowledge in each field makes it difficult to find instructors adequately trained to handle all of the sciences. At Howard College in Alabama, at Boston University, and at Michigan State, however, one fused science course with background material chosen from both fields is given. The basis for this is, of course, that attitudes and broad concepts are the same in all sciences, and that it is not the function of a general education course to teach particulars. An effort is made to balance the materials used between biology and physical science.

The length of time devoted to science in general education varies in different colleges from one semester to two years. A number of colleges require general education courses in mathematics in addition to the science requirement, though this course is sometimes administered in a separate area. Florida State University has an especially well developed general education course in mathematics.

The central theme of general education science courses varies from college to college. At Harvard, one of the courses in biological science is built about environmental relationships. At Anti-

och, man is the central theme for a two-year course combining psychology with biology. Transylvania College uses an historical approach very effectively in parts of the program. The tendency is clearly away from any line of demarcation between specific sciences, e.g., botany and zoology. In most courses in biological science the emphasis is on scientific principles and concepts, attitudes, and critical thinking. The material of the course then is chosen on a basis of (1) its usability for developing these objectives, (2) its future usefulness to the student both as an individual and as an educated member of society. In a few cases, it is evident that the preparation of the faculty or other factors tend to place the emphasis strongly in one area.

PROCEDURES

It is generally agreed that science must be experienced in order to develop functional scientific attitudes. Hence, laboratory experience is an important element in any science course. At Bennington College most of the science courses are taught entirely in the laboratory, with sections of ten students or less, thereby becoming the envy of all science instructors. It is not difficult to arrange for laboratory work with classes of forty or fifty, but it is an enormous problem with thousands of students. Yet it is being done effectively in some colleges, notably Michigan State, with some 4,500 students a year in the course. Other colleges, unable to arrange for staff and facilities for individual laboratory work, have developed various techniques in an attempt to accomplish similar ends. Some use large scale demonstrations and visual aids extensively. Others have developed museum displays appropriate to the subject under discussion. Many of these displays are ingenious and very well done and are excellent teaching aids, especially when accompanied by thought-provoking questions. But in all cases such techniques are recognized as substitutes which do not provide the student with first-hand experience. On the other hand, much so-called laboratory work of the work-book type is mere "busy work" providing little stimulus for active thinking. A laboratory course, to be an effective means for developing scientific attitudes and critical thinking, must be carefully planned and directed by a well-trained teacher who sincerely believes in his work.

Discussion periods are second only to laboratory as a method for clarifying concepts. Hence, again, the number of students in a section must

be small enough for personal contact with the instructor. This would mean many sections in the large college. The effectiveness of the discussion period is, again, due to the enthusiasm and resourcefulness of the instructor. In some cases the discussion is combined with the laboratory. This ties up expensive laboratory space when a classroom would suffice. The combination has its advantages in that much productive discussion arises in the laboratory, and the period is less apt to deteriorate into a quiz section. An advantage of the separate discussion period is that the general concepts discussed are apt to be broader, utilizing all sources of information, rather than only those phases considered in the laboratory. Thereby the discussion period can be used as a summarizing, evaluating hour.

Lectures are given in most colleges, though much less so in those colleges with small classes. However much the emphasis is placed on attitudes and methods of procedure, factual material is essential for critical thinking, and lecturing can be a relatively efficient means of presenting concepts and principles and supplying facts in quantity in a brief space of time. The "percentage take," of course, is dependent on the effectiveness of the lecturer and the receptiveness of the student.

In some courses, as in physical science at Florida State University, a unit of work may begin with a lecture given to one hundred or more students by an expert in the specific field. This is followed by small discussion sections led by instructors who have attended the lecture and are especially versed in conducting scientific discussions. At Colgate, on the other hand, the unit is begun by a series of small discussion groups and climaxed with a lecture or demonstration by an expert in the particular subject under discussion. In other colleges, the same instructor gives the lectures and conducts the laboratory and discussion sections for his group of students. Thus he can unify the various aspects of the course, watch the progress of his students and check the success of his teaching methods. Except in very small colleges, an instructor who handles all phases of the course teaches only this course. In larger colleges this same organization may be followed with many instructors, each teaching his own section. The division of a course between instructors may be made in different ways. One instructor may give the lectures and others conduct the laboratory sections. Two or more in-

structors may divide the lectures according to specific interests. This requires close collaboration at frequent intervals. The tendency in college generally is for each instructor to give the entire course for his particular group of students on the basis that it gives the course greater unity. Such a plan demands of the instructor a rich and varied background and broad experience as well as constant effort to keep abreast of several fields.

TEXTBOOKS

Textbooks that fit the needs of a course that has evolved out of the experience and thinking of the faculty are hard to find. Most favored are those that place emphasis on scientific approach and broad concepts. In many cases, faculty members have written their own texts or have resorted to the use of many reference books. This latter method was most strikingly demonstrated at Boston University, which has built a reference library composed of some fifteen or twenty different reference books for one course, on the basis of sixty copies for every one hundred students. This is financed by charging each student a book fee comparable to the amount he normally spends for texts. As the library is built up, the size of the book fee is reduced. Few colleges can boast such a functional reference library. Practically every course has its own syllabus which emphasizes its objectives and unifies the various aspects of the course.

EVALUATION OF STUDENTS' ACHIEVEMENT

Examinations in large colleges are, of necessity, mostly objective and machine corrected. Copies of used examinations are on sale in student bookstores, hence are in general circulation. This means that new examinations must be composed each time. To test attitudes and broad concepts by repeated objective examinations over the same general material requires ingenuity and the know-how of an expert of wide experience. A board of examiners constructs and administers these examinations. In some cases, members of the teaching faculty contribute and advise in the formulation, as at the University of Florida. At Michigan State, at least one member of the examining board is also a member of the teaching staff of the course.

In smaller colleges, more questions of discussion type are used, resulting in a more subjective evaluation of the student's achievement. Also practical laboratory tests and oral quizzes, as

well as many other evaluating techniques, are used in both small colleges and large, where the class is divided into small sections for laboratory and discussion. In no case were the testing techniques considered to be thoroughly satisfactory for measuring the attainment of objectives of the course. Everyone is awaiting the tests being devised by the Committee on Evaluation in General Education of the American Council on Education under Dr. Paul Dressel.

STUDENTS AND TEACHERS

Should all students, whatever their objectives, take general education courses? There is widespread agreement that an English literature major, for example, will profit more from a general education course in science than a specialized one. In many colleges, however, owing to the attitude of students toward required courses and difficulties in scheduling, students elect which course they take. Next in line toward an acceptance of the general education philosophy are those colleges which require the general education courses in those areas outside the major. Those that wholeheartedly accept the philosophy of general education feel that this broad conceptual approach is equally important for those who expect to specialize and for those who go no further in the field. This last view seems to be gaining in acceptance. It is vital that the general education concept be maintained in such courses, and that the course does not revert to a specialized beginning course in the major field. In some cases where biological majors take the general education biology course, the basic botany and zoology courses are built on this background. In others, these courses are eliminated from the major program and the student goes directly into advanced courses such as Plant Morphology, Comparative Anatomy, Vertebrate Zoology, which must be somewhat adapted to this different type of preparation.

The general education science program, of necessity, varies with the college, its personnel, and its objectives. What works in one situation may not in another. The very diversity of patterns indicates the amount of experimenting which is being carried on and that in itself is a promise of progress. All of these patterns have their good points, and all have features peculiarly adapted to a local situation.

Perhaps the most universal difficulty with general education courses is the lack of appreciation on the part of the students of the objectives

of the program. These may be set forth clearly in the syllabus which they are asked to read. They may be explained at the beginning of the course and recalled frequently during the year. Yet the student will say, "I learned more chemistry in high school than I learned in this course." Apparently "this course," which was superb in planning and execution, failed, as far as that one student was concerned, to lead him to think. Perhaps we, as an organic chemist once said, expect to approach 100% return on our efforts while any organic chemist knows that if he recovers 50% of a substance he is doing well. When we get effective criteria for measuring the success of our efforts, we may find that we are accomplishing more than is sometimes indicated.

The vision and understanding of the faculty are of vital importance to the success of any program. These factors are not necessarily a function of the age of the instructor or the richness and breadth of his background. Younger instructors may show more enthusiasm and inclination to experiment. Older members who

recognize the virtues of the program, can match these characteristics with broader experience and appreciation of the problems involved in college teaching. Several administrators indicated that they had difficulty in securing instructors who were prepared to teach general education courses, particularly in physical science. In most cases the instructor had been trained on the job. This is an expensive procedure, especially if he then leaves the institution for a better position. It is quite evident, after visiting many classes, that the success of any program rests with the individual faculty member, and with the collective morale of the group executing the program. A teacher of vision and rich background may make a general education course out of anatomy. But this does not mean that he would not more nearly achieve his objectives with a course designed for the purpose. Top-notch instructors, working in harmony with their fellow instructors and wholeheartedly sold to the objectives of the program, will put over a successful general education program whatever its pattern.

Art of Teaching

"These, then, are the crude materials of the art of teaching—your personality, your subject-matter, your pupils. Their interaction will determine your success in achieving an interesting style, and that in turn is dependent on the same elements that make up any other art—unity, form, and rhythm."—Henry W. Simon, Preface to Teaching. New York: Oxford University Press. 1938. Page 87.

Three Problems of General Education

A University of Michigan psychology professor states three problems, relevant to all higher education, which come into focus in general education. The questions are stated. Answers are needed.

By W. J. McKEACHIE

Educational problems are never solved. As in science, progress is essentially a process of reformulating problems, answering empirical questions, specifying the problem more exactly, and communicating more clearly. Our general education programs are now at a stage where we need once more to ask ourselves some basic questions.

► When general education programs first came into vogue, their builders were men with a gleam of purpose in their eyes and a ready willingness to debate the objectives of education with any advocate of "mere" technical education. To some extent such men are still extant, particularly in colleges which are inaugurating new general education programs. But as these objectives are formalized, as they become entombed in journal articles and college catalogs, their motivational value seems to decay. New faculty members who come into the program read and accept the goals but are little affected by them. The students who looked on the new program as a challenge graduate, and new students take it for granted. How can the formulation of objectives be carried on in such a way that the objectives not only have relevance to the day to day work of students, faculty, and administration but also are adapted to the changing conditions of students, institutions, and society? We presently have no well-established answer. The problem suggests that formulation of objectives should be an on-going cooperative process.

► Almost everyone agrees that in general education programs, more than in almost any other area of higher education, one of the essentials of success is satisfactory interpersonal relations between the faculty members involved. If one is to do a good job, he needs to meet with his colleagues, to be able to discuss problems cutting across disciplines, and to feel secure enough in his own discipline so that he can admit his own ignorance in other fields and tolerate questions about his own field. But developing an understanding of other fields takes time, seriously discussing intellectual problems with colleagues takes time, and these expenditures of time are

often not the sort that are rewarded by promotion and salary raises. What administrative arrangements can be devised to facilitate friendly interaction between faculty members? What rewards can be offered to the professor who wisely uses his opportunities for "cross-fertilization?" Interdepartmental faculty groups tend to rise and fall. We know little about what makes some continue while others perish. It may be that rewards of recognition and of warm personal relationships can substitute for material rewards. In general, however, it would appear to me that the success of a general education program depends upon the ability of the participants to retain status in their own fields.

► Since the success of general education programs ultimately rests on the shoulders of those who teach in the program, the problem of training such faculty members is a major one. We want faculty members who are themselves broadly educated; yet on campus after campus, the faculty in the general education program has a lower status than faculty members teaching traditional departmental courses. Judged by our usual standards of academic status these differentiations are often justified. The general education faculty frequently is lower in research productivity and less likely to be awarded honors in scientific or learned societies. How can we train instructors for general education in such a way that they are broadly educated and yet productive scholars? How can we train graduate students so that they command a broad area of knowledge and yet know their own limitations? It may be that we need more training programs which give supervised experience in interdisciplinary teaching as well as training in research.

► The three problems I have stated are not peculiar to the general education program. They are relevant to all of higher education. But they come to a focus in general education programs. The general education movement has stimulated progress in the formulation of objectives, in facilitating interaction between members of different disciplines, and in broadening programs of graduate education, but the problems in these areas emerge again more sharply defined and even more challenging.

¹ Based on summary address delivered at the Conference on the Relation of Psychology to General Education at Knox College, March 20, 1954.

Summer Conferences in Collegiate Mathematics¹

A mathematics professor who has been on the faculty of Oklahoma A. & M. College for twenty-five years, director of the National Council of Teachers of Mathematics, and a contributor to his field, describes conferences that have been held in recent summers and suggests agenda of future conferences.

By JAMES H. ZANT

Summer conferences in collegiate mathematics have been held during the summers of 1953 and 1954, and it is expected that there will be others next summer and other summers. These conferences were sponsored by the Mathematical Association of America and supported by the National Science Foundation. They were held at the University of Colorado (1953), the University of Oregon (1954), and the University of North Carolina (1954), and lasted for a period of eight weeks.

The aim of each conference was the same: "to foster the improvement of undergraduate training in mathematics." This statement was included in all brochures sent out announcing the conferences and was evidently endorsed by the Mathematical Association of America. This objective was to be attained by providing college teachers a stimulating experience in mathematics through inspiring lectures by eminent mathematicians who are also gifted expositors, individual and group study in a pleasant and congenial atmosphere, and informal discussions of problems of mutual interest. The lecturers chosen and the topics on which they lectured were designed to give even the nonspecialist "clear and inspiring pictures of the sweep and depth of present-day mathematics." Important new concepts in contemporary mathematics were introduced and old ideas were presented in terms of modern thought.

Stated in another way, it was the purpose of these conferences to give, especially to those participants who had been away from the study of mathematics and away from contacts with the graduate school for some time, some idea of the development of mathematics in modern times. This, together with the stated aim of the im-

provement of undergraduate training in mathematics, implies that the basic concepts of modern mathematics should be included in the undergraduate curriculum. The need for this has been recognized for many years by students beginning the study of graduate mathematics as well as by the professors of mathematics in the graduate schools. Moreover, concepts of modern mathematics are necessary for adequate understanding of the subject even at the more elementary level.

A number of activities were arranged for the participants of the conferences. These were designed to aid in attaining the aim quoted above. The discussion here will deal primarily with the conference held at the University of North Carolina in the summer of 1954. The other conferences had a similar organization.

► The main lecturers were Professor Emil Artin, professor of mathematics in Princeton University, on *Selected Topics in Modern Algebra*; and Professor Tibor Radó, research professor of mathematics in Ohio State University, on *The Mathematical Theory of Rigid Surfaces: An Application of Modern Analysis*. The daily lectures of both of these men were carefully prepared and brilliantly delivered.

Professor Artin's lectures dealt with the following topics: sets and maps, groups, rings and fields, elementary arithmetic, field extensions, and Galois theory. While these topics do not cover the field of modern algebra, it is easily recognized that they are areas in which the theory has been essentially complete for some time. They constitute a carefully organized section from modern algebra, logically connected so that a person who was hearing it for the first time could follow and understand the discussions and proofs from first to last. At the end of the lectures he had a functional concept of modern algebra which, though incomplete, would be useful for further study and a help in incorporating some modern algebra into the undergraduate curriculum. He should have gained a "clear and inspiring picture of the sweep and depth of present-day mathematics." Others, with some knowledge of modern algebra, received a new look at the subject with a different organization and with different proofs.

Professor Radó's lectures were of a different character and for a different purpose. As Professor Radó himself stated, the mathematical

¹ Read on October 28, 1954, before the Oklahoma Section of the Mathematical Association of America, in Oklahoma City.

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tools required for application of modern analysis are all on the collegiate level, so the subject may also be viewed as an application of undergraduate mathematics. Another purpose of the lectures was "to present an example of mathematical research in action by giving an account of a subject under sustained study for a period of two generations." The attempt to solve the problem of rigid surfaces involves the objective of finding "all shapes (and, if necessary, boundary conditions) for which [a flexible, inextensible] membrane is rigid. This is a question of 'cataloging.' We must ask *why* certain shapes are rigid while others are not. In all of this we will not be entirely successful. There are still many open questions in this field; indeed, a complete explanation of the phenomena observed in the case of [a flexible, inextensible membrane with a certain boundary condition] is not known."

Professor Radó then proceeded to discuss this problem of rigid surfaces carefully and rigorously, though not completely, employing many of the theorems and methods of modern elementary analysis. Many of the theorems were taken from the work of other mathematicians who have worked in this field for a period of eighty years beginning when a group of German engineers brought the problem to some of the Göttingen mathematicians. "Among the famous mathematicians who have made important contributions in the field are Liebmann, Weyl, Hilbert, and Darboux. Recently the subject has received much attention in Russia."

It was implied that many of the results given had been discovered and proved by Professor Radó and some of his students and colleagues during his tenure as a professor of mathematics in Ohio State University. At the end he again stated that there were a number of unsolved problems in this field; the question of whether or not the results given have technical applications is still unanswered but "the theory does give a good example of the use of elementary mathematics in a research problem."

Professor Radó's lectures presented subject matter with which few, if any, of the participants were thoroughly familiar. Most of the 'tools' used, however, should be familiar to any student who has had recent undergraduate courses in advanced calculus and the function of a complex variable. Since this was the case, the lectures were probably more stimulating to some members of the conference than were those on modern algebra.

► A seminar on curricular and related problems was conducted by Professor F. L. Griffin, professor emeritus of mathematics in Reed College (now president of Reed College). The topics discussed included mathematics needed in the physical sciences, the life sciences, the social sciences, and in general education, the relative importance and placement of topics, freshman courses for various purposes, advanced courses, something about teaching procedures, testing and the like, and brief discussions on superior students and competitions. As would be expected from Professor Griffin's background in classical mathematics and from his pioneering efforts in the field of general mathematics at a college whose student body is carefully selected, the discussions dealt more with the classical aspects of mathematics and the general ideas involved than with modern concepts and applications of mathematics to solution of particular and practical problems.

In spite of the fact that the approach was classical, many stimulating and practical ideas came from it. Professor Griffin is one of the grand old men in the field of college mathematics and in undergraduate teaching; he pioneered in a successful and workable reorganization of college mathematics which could well serve as a guide to the problem now facing us. Adapting his methods to our present needs may prove wiser in the end than the plans proposed by less experienced men.

► Several special lecturers were at the conference for brief periods. Professor R. M. Thrall, associate professor of mathematics in the University of Michigan, discussed "The Mathematics Needed in the Social Sciences." He stated the following reasons for the social scientists' interest in mathematics: to read their own literature, to communicate, to construct models, and to recognize new areas in which mathematics can be useful. Recommended subject matter includes: logic, set theory, axiomatic systems and models, functions, calculus, probability, and matrix theory.

Courses for this purpose are now offered in the University of Michigan, the University of Illinois, Purdue University, Princeton University, Stanford University, and Iowa State College. A summer institute on Mathematics for Social Scientists was held in 1953 and two will be held in 1955.

Professor Thrall's discussions revealed an area in which the usefulness of modern mathematics is rapidly receiving recognition. Both the

mathematicians and social scientists, however, feel that the initiative should come from the social scientists. When they realize that solutions to their problems can be accomplished more easily by mathematical techniques they will be willing to learn theory and skills.²

Professor A. W. Tucker, professor and head of mathematics in Princeton University, discussed subject matter that should be included in "Undergraduate Courses in Geometric Concepts and Topology," dealing briefly with such topics as conic sections, map projections, Gaussian curvature, surfaces of constant curvature, continuous vector fields and mappings, three-dimensional manifolds, and fiber spaces and networks. Professor Tucker probably covered too much ground in the time he had available (one week).

Professor Franz E. Hohn of the Bell Telephone Laboratories and the University of Illinois, delivered two lectures on "Some Mathematical Aspects of Switching." Based on some of the work he has done during the last two years in the Bell Telephone Laboratories, these lectures served as an excellent illustration of the application of the concepts of modern mathematics to the solution of practical problems. Use was made of Boolean Algebra and Matrices.

Main lecturers at the other conferences were Professors R. L. Wilder, B. W. Jones, Hans Rademacher, and D. G. Bourgin.

► A considerable gap exists between the discussions at these conferences and a practical method of going about improving the teaching of undergraduate mathematics. Some provision should be made at future conferences to spell out specifically just what can be done in a college department of mathematics so that modern concepts can be introduced into the undergraduate curriculum. This would be warmly appreciated by many and is badly needed, especially in the smaller colleges where staff members have neither the time nor the background to do it themselves.

The Mathematical Association of America Committee on the Undergraduate Program in Mathematics is giving attention to this problem. Professor Tucker reported briefly on the work of the committee. The line of approach is first

to create one universal freshman course for all reasonably qualified students, presupposing intermediate algebra and high school geometry, and ignoring the remedial courses for students who enter college without adequate mathematical training in school. Only by such a universal course can liberal education best be served.

In most colleges and universities this is an unrealistic and unpractical approach. To many it seems that an approach more likely to succeed is to begin the process at the junior or senior level where the students are beginning specialists whose interests are in mathematics, engineering, or the sciences. This will probably involve junior or senior courses in algebra, geometry, analysis, and mathematics foundations.

The reaction usually encountered from mathematicians to either of these proposals is that the courses should be developed by the professor in his own college. If the professor is well trained and has enough time, this is probably the best solution. As we know, this has been done successfully in a number of institutions in this country. It is doubtful, however, that it will occur in the very places where these revisions are needed most. The teaching loads and administrative duties are too heavy and teachers have not had recent enough contact with modern mathematics to feel adequate. For many, what is necessary is an uprooting of ingrained habits of thinking and teaching. Some suggested ways in which this problem may be attacked in future conferences are:

- 1 Have as one of the main lecturers someone who has organized and taught such a course and who is willing to show how it can be done.
- 2 Organize a seminar or several seminars in which members of the conference can work on the problems of organizing such courses.
- 3 Form voluntary study groups in which the leadership can come from within the group.
- 4 Encourage "in between conference" work in an institution or in a group of institutions where experimentation with the organization and teaching of such courses will be possible.

This conference did very little, comparatively, with the modern mathematics needed in related fields such as engineering, industry, and government service. The interest in Professors Thrall's and Hohn's discussions indicates that this is an area which should be explored further in the planning of future conferences.

² R. R. Bush, W. G. Madow, Howard Raiffa, R. M. Thrall, "Mathematics for Social Scientists," *American Mathematical Monthly*, October 1954, Vol. 61, No. 8, pp. 550-561.

The Goodly Fellowship

"In a sense, teaching cannot be taught, since essentially it must be a flaming and an outgoing of the spirit. It is possible, however, that men and women who have succeeded as teachers can offer some guidance which will be helpful to the novice who has a latent capacity for teaching."—Bernice Brown Cronkhite, *A Handbook for College Teachers*. Cambridge, Massachusetts: Harvard University Press, 1950. Page v.

"One or two of our company this evening," said the Professor, "are finishing their first year of college teaching. I have been wondering whether we have been good colleagues and 'elder brothers' to them. Could some of us, from our thinking and experience as college and university teachers, have given them some special help—by suggestion, by comradeship, or otherwise? Next fall, we again shall have two or three new instructors on campus. Suppose they were here tonight: what might we say to them? What would you—each of you—say to a young college teacher just beginning his work on our campus?"

ASSOCIATE PROFESSOR OF MATHEMATICS:

"In the transformation from college student to college instructor, the viewpoint of the former seems easily forgotten. I should recommend constant and conscious effort never to lose that student viewpoint. Such effort will very materially affect, for the better, every phase of college teaching."

PROFESSOR OF ENGINEERING:

"I recall that college teaching was not on my professional horizon when I graduated. Yet I believe that, during all the years of my education, I must have been studying and appreciating, instinctively and without conscious purpose, a long series of teachers quite as much as the subject matter they aimed to impart. I still believe I was exceptionally fortunate in those personal influences of teachers, and I would wish for every young teacher feelings of equal cordiality toward past teachers."

"A year after graduation, with no formal training in pedagogy, I found myself hard at work as a university instructor undoubtedly influenced by the methods and personalities of many experienced people. Such is the way, though probably not the best way, many enter college teaching. I suggest that every young teacher look to those of his teachers whose memory he cherishes hap-

pily because they were really good teachers and draw from them guidance and inspiration as he strikes out in teaching service."

ASSISTANT PROFESSOR OF BUSINESS:

"The young teacher also can look to the good teachers who are now his colleagues. My advice would be: Visit classes taught by older faculty members who are known to be efficient teachers. Take your teaching problems to them—other problems, too. The friendship of a great teacher will be a source of inspiration, guidance, and comfort to you."

ASSOCIATE PROFESSOR OF CHEMISTRY:

"I offer as a motto for successful teaching: Instill interest and enthusiasm for your subject, and you will find that the good fight is won. The student now will *teach himself*."

ASSISTANT PROFESSOR OF INDUSTRIAL ARTS:

"From time to time we all ask ourselves: How can I cause the student to be critical of an area of information? Many of us believe that one good method is the 'project method.' The student is given a comprehensive problem to solve which when completed will have exercised one or more basic concepts. If he successfully completes the problem, he of necessity has begun to be critical of one or several areas of information and may be able to apply the information to other more complete problems."

"Our teaching begins to break down when we assign a problem and then immediately begin to show the student how to solve it. If I handed you a Chinese puzzle, would you want me immediately to show you how to work it? If I did, you would learn the solution of that puzzle, but would be denied the pleasure of solving it for yourself and you would have learned little or none of the basic concepts of puzzle solving. So with teaching: we must be constantly aware that one of our objectives is to help or cause the student to become increasingly adept at problem solving in his area of endeavor. We should help and guide him but not show him how."

ASSOCIATE PROFESSOR OF BOTANY:

"I'd like to move from Chinese puzzles to an experience I had when as a young teacher I was teaching a class of Chinese students. With the aid

of chalk and blackboard I was trying to get across some idea of the nature and diverse structure of the Green Algae. Professor Twiss of Ohio State University, retired and white haired, sat in my class. At the end of the hour, in his mild and kindly way, he asked whether I had any specimens of algae about, commenting that he always found some kind of real specimen which students could see and handle, even if it were only in a bottle, helpful in holding their interest and gaining their understanding. The suggestion was so simple and obvious that I was ashamed not to have thought of it. It made a lasting impression which has returned to help me countless times in preparing for my classes over three decades of teaching."

INSTRUCTOR IN EDUCATION:

"I should suggest to a young teacher that he seek enthusiasm within himself through which he can motivate his students and so elicit their best performance. This could center around methods which encourage their fullest participation. He can be sure they are eager to do their part. We should attempt to make students feel that the course is their course, not ours. If courses were offered just for the teachers' benefit, I'm afraid a good many of us wouldn't be around. The courses belong to the students. With enthusiasm the courses can be made pleasant and still contain the thought-provoking stuff any course should have."

PROFESSOR OF ENGLISH:

"In a spirit of giving a word to the wise, I'd like to refer to an incident at Woodberry Forest School. When the experienced 'masters' called at the new master's room to take him out on the first free day of the school year, they found him laughing to himself. Of course they asked him why. Said he, 'The joke is on the school; it hired me to teach the whole year and I have taught all I know in the first week.' In my own first year of teaching, my class completed the assigned text by Thanksgiving. Both the Woodberry master and I, in efforts to give as much as we could, failed to realize our places in a *system* of education. We had not learned to 'pace' ourselves."

ASSOCIATE PROFESSOR OF ENGLISH:

"As I wandered along the banks of the Metolius River last week end, it occurred to me that a teacher, by his very nature, is a wanderer. His intellectual interests carry him through many

fields of knowledge and into many intriguing nooks and crannies. His natural curiosity leads him to exciting adventures. When I came to the question of whether there is a relationship between this wanderlust and the quality of a man's teaching, I recalled how John Masefield had said that wandering in itself is merely a form of self-indulgence; if it does not help other persons to gain some imaginative possession of some part of the world, to Masefield it seemed a 'pernicious habit.' Mental and intellectual wandering also can be self-indulgence. To keep it from becoming a destructive habit, a college teacher might well use it in classroom and conference to give to others the imaginative possession of some part of the world."

ASSISTANT PROFESSOR OF ART:

"There is another kind of wandering. My advice to a young college teacher would be to find a reasonably promising situation as early as possible and then to stay with it as long as it can possibly be maintained as reasonably promising. In twenty-seven years of service on four campuses, I have observed that by and large those who stay on the job longest do have the greatest influence, not to mention salary, security, and prestige. I do not mean taking advantage of assured tenure simply to have an easy life, but rather to allow oneself to do his life's work to better advantage."

"It is inevitable that any college teacher will be profoundly disturbed about things from time to time. This does not necessarily mean that he should go somewhere else, not at least until every resource has been tried to work things out with the people involved. The most difficult but in the long run the most fruitful achievement is to maintain working relationships with contrary colleagues. This must not mean giving up your principles or fundamental beliefs. It does mean, among other things, trying to understand the ideas of others and making your ideas clear to them. You may find that the cumulative values of working out difficult problems with people you come to know over a period of years will outweigh the apparent values of finding greener pastures."

HOST PROFESSOR:

"This may or may not be a good time to suggest that we do a little minor wandering. I propose that we move into the dining room where we shall find, not green pastures, but some refreshing green punch to drink and some cookies to eat."

"The Human Career"

THE HUMAN CAREER by Robert Ulich. New York: Harper & Brothers. 1955. xii + 255 pp. \$3.50.

Many men and women visiting the Chicago Art Institute come upon Lorado Taft's "The Solitude of the Soul" and, having gazed upon it, go on their way, deeply moved. What Taft expressed in sculpture, Robert Ulich analyzes and amplifies in literature.

The human individual, physically set loose at birth, spiritually set loose through education and maturity, feels "his nearness to, but also his distance from the source of life." To Ulich, man thinking is "the greatest act in creation, the emergence of life's self-consciousness through the mind of man." The book is concerned with "man in his existential situation, confronted with the great mysteries of life, with birth and death, progress and failure, belonging and loneliness, finiteness and infinity."

Life's deepest mysteries are pondered near the middle of the book:

... why is there consciousness and not merely unconsciousness, or why *are* man and mind? Why did evolution of life break the boundaries of the inorganic? Why is there something rather than nothing?

With such questions we transcend the possibilities of human thought. There is no other way for mortal man but to search boldly for all that is and may ever be within the limits of the explorable, for only in this way may he reduce the territory of darkness. The inexplorable and unachievable of today may be tomorrow's scene of victory. But there will ever be cause for man to bow his head in humility. For the great Unknowable will always stand before him in silent majesty, exciting his endless curiosity, yet unconquerable.

This book is an initiation, but its plan and style are so deceptively lucid that the reader may not realize he is led into the very holy of holies of thinking man's endless quest. For example:

... amidst all confusing actions there is a criterion and an answer to the quest for certainty; it lies in our concept of man (Chapters III and IV). The good is that which helps a person to widen the narrowness of his ego, to cultivate his emotional and intellectual life, and to develop his rational and intellectual life in its various aspects of contemplation, intuition, and faith. We also say that that is good which helps him fulfill his human destiny. Whatever prevents him is evil.

A reader will find some unfamiliar glimpses of great thinkers like Thomas Paine, Friedrich Froebel, and John Dewey. He will find insightful

interpretation of the significance of art and poetry, science and religion. He will find some striking antitheses. He will find some poignantly expressed wisdom:

... the emotional response may create an inner conflict, at first ploughed under and forever invisible to the untrained perception, but developing under many disguises to destroy the harvest of life.

The reader will find, above all, a man thinking: a discerning personality; a mind moving courageously, keenly, and humbly near the frontiers of thought; a spirit appreciative of the schools of thought but dominated by none. The portrait of the author on the jacket shows the countenance of a man one would wish to know.

The author says he "would like to see this book especially in the hands of those interested in the great issues of human education." A reading should contribute light and strength to the philosophy of life of any college or university teacher. It should contribute similarly to his philosophy of education.

The teacher's life as an individual will set the tone and the effectiveness of his teaching. His vision of his own place in a great scheme will determine whether he will have a real part in shaping education to the needs of youth in a transitional era. A present and a future unlike anything in the past make challenging demands on teachers and teaching.

Only self-transcendent man who feels himself as a participant in the unending work of the creation will have the courage to create a new education, and through it one more weapon for the liberation of humanity.

Every man has a career which is more important than that of his profession or vocation or any other role that each man in his time may play. It is his human career, the unique course of life to which his peculiar endowments and opportunities call him.

Somehow thinking man must acknowledge that he is not his own creation, but a participant in a greater whole.

It is life, or nature, or the creation, or whatever name we may give it, which lives in us and of which we should consider ourselves the reverent keepers, the trustees, the guardians.

This brief tribute to this new book and its "philosophy of self-transcendence" is written in the hope that many who read this journal will read the book and find it moving and inspiring.

